

Building Networks for People

News Update from
D-Link India Limited

D-Link[®] Direct

July 2001



K. R. Naik
Chairman & Managing Director

Dear Friends

Over a rock solid foundation of quality, which we have nurtured for over eight years, D-Link has emerged triumphant in developing, producing and marketing high value networking products.

D-Link has grown tremendously in all these years and has been able to achieve the topmost position in

networking industry. It is a matter of pride today that D-Link is known for its quality products. It is only due to the committed support and trust of our distributors and employees that D-Link has grown to live up to its mission. To seize the opportunities; challenge the future and revitalize the national industry is our immediate task. This great task encourages us to open up, make unceasing progress and surmount obstacles constantly.

To address to the higher expectations of our customer, we have set up our third manufacturing unit at Goa to meet two objectives-firstly, to meet D-Link's internal demands and secondly, to become a worldwide source for manufacturing products in line with D-Link Corporation's plans to export to other OBU's worldwide. The plant intends to operate in two shifts, thereby producing enhanced qualitative products.

This venture has been financed through an IPO, which D-Link India Ltd. came out with in March 2001. The amount raised through the IPO will be used for the various expansion plans of the company.

To meet the growing demand, this year we entered into the Motherboard arena. The Motherboards were introduced in India under the brand name of "Digilink". The brand name "Digilink" was introduced for the products, which were manufactured to suit Indian conditions and to cater to local market requirements.

In our efforts to be best in the industry, we have not lost sight of our responsibility to society. Our main goal has always been to strive towards total customer satisfaction and overall business excellence without compromising social responsibilities. Our manufacturing plants in Goa have a STP (sewage treatment plant) ensuring zero emission to the environment and full utilization of all our resources. Besides D-Link has taken up the task of beautification and landscaping of GIDC public utility areas adjacent to our plants. We have been recognized and rewarded for our environment and efficient manufacturing by being awarded the ISO 14001 certification in May 2001.

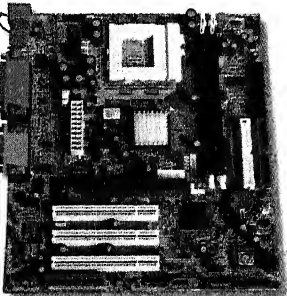
And so our march toward progress
as we strive to deliver
enhance D-Link's foremost

News & Events

D-Link forays into new product segment-Motherboards

D-Link India Ltd. acclaimed as the Volume market Leader in networking since the last few years is now seeking an entry into the segment of motherboards under the brand name of "Digilink". The brand name "Digilink" was introduced for the products, which were manufactured to suit Indian conditions and to cater to local market requirements. It will be the umbrella name for all such products, which currently also comprises of the digital camera range.

Digilink's first model of motherboard DMB-815EM has an Intel 815E chipset microATX board, which is currently the largest selling specifications model in the world. The motherboards come with a 2-year warranty and are being manufactured in the recently inaugurated third manufacturing plant at Goa. The D-Link facility at Goa has the ISO 9002 and ISO 14001 certifications and possesses the latest SMT manufacturing equipments.



D-Link's strategies, in the past, have focused on volumes and the company has tried to make all its products widely accepted by the masses rather than concentrating on niches. D-Link India Ltd. has products spread across the entire spectrum of the networking needs of enterprises and it aims to achieve a similar position with the

DigiLink brands too. The motherboards are aggressively priced to ensure that they are not out of reach of the target markets. The company plans to target primarily OEMs and assemblers with these motherboards.

In order to promote and market the motherboards in India, D-Link India Ltd. has set up special technical teams and support/service centers with a network of 16 offices and 21 distributors across the country.

In near future, D-Link proposes to introduce variants with higher and lower specifications as well as models to suit the needs of various types of buyers. The company foresees a convergence of technologies by which it would be possible to bundle networking products and motherboards together as today more than 90% of PCs come with build-in modems and LAN cards. In future, models with onboard network LAN and onboard modems will stretch D-Link's leadership from the networking segment to the motherboard segment also.

D-Link IPO

In an effort to reengineer its business from a company manufacturing, distributing and maintaining networking products to becoming a 'Total Technology Company' having full-fledged software and R&D capabilities which will help in the design and development of networking products, D-Link India Ltd. decided to take on the challenge of adapting to the ever-changing markets and has been successful in this venture. Even though the application software industry has taken a back seat for the time being worldwide, the core technology development based software has tremendous scope.

D-Link's maiden public offering, a part of its transition into a total technology company consisted of a project cost of Rs. 55 cr., of which about Rs. 45 cr. was raised through the public offering in March 2001 and the rest through internal accruals. The IPO money was earmarked for various ventures, which comprised of the third manufacturing plant with a new third SMT line, fiber optic division, copper structured cabling division and software initiatives.

D-Link's third SMT line is geared at helping D-Link India Ltd. cater to the growth that it has been experiencing in the past few years. D-Link's copper and fiber structured cabling initiative comprising of the latest technology and clean room facility is geared not just at domestic sales but also to meet the structured cabling requirements of D-Link OBUs worldwide.

D-Link's software and R&D initiative is focused mainly on development of core technologies that would enhance D-Link's existing and future product line capabilities as well as an option to look at application development. The major investment in this area would be on the various specialized and hi-tech software tools required for core programming and the software development center and facilities. D-Link Corporation, which already has development centers in Taiwan, China and USA is targeting, through D-Link India, at meeting its future R&D needs. This is primarily due to the fact that India possesses excellent manpower capabilities, which can deliver quality output in the right time frame and at the right cost. D-Link India Ltd. has set up software and R&D centers at Bangalore, Goa and Mumbai with the Bangalore center fully operational having about 25 specialized team members. The core programming areas focused on are broadband and other access technologies like cable, XDSL etc.; convergence technologies like VoIP, IP telephony etc. and network management systems (NMS) to cater to D-Link's core networking technologies focused on products like Layer 3 switches and combination routers etc. These are being worked on by specialists in the fields of Digital Signal Processing (DSP), Embedded Systems, Protocol Programming etc.

The shares were listed on the BSE, NSE and the Bangalore Stock Exchanges. The issue was received favorably and enjoyed a smooth sail of operations, despite adverse market conditions.

Thus, D-Link offers a gradual price appreciation but a lucrative long-term investment opportunity for the sagacious investor.

● Third Manufacturing Unit

To focus on increased demand and to scale up production at an optimum level, D-Link India Ltd is now operating with three SMT lines, instead of only two lines, which were bearing the major load of production. Previously, due to the short fall caused by inadequate capacity and the burgeoning demand, D-Link used to import some of the finished products.

After considering these factors, D-Link decided to expand its operations by setting up a third manufacturing unit at Verna Electronics City, Verna, Goa. This new facility will fulfill the internal demands of the company and also become a worldwide source / hub for the manufacture of certain D-Link products in line with D-Link Corporation's product lines of NICs, Hubs, Switches, Modems etc.

The proposed third SMT line, which is faster in speed and better in production quality, will immediately cater to the increase in demand. The new plant will operate in two shifts thereby enhancing the capacity, which will result into better quality product. The whole set up is sophisticated, ultra modern and fully automated with clean room facility for fiber components used in passive data communications and for copper structured cabling production. It also has special aspects like component checking and packing, which is done in a semi-automated facility.

To address the latest technological needs, D-Link has purchased state of the art machinery for the new SMT line and also plans to upgrade the existing SMT lines to a higher capacity by installing an additional line. Besides, D-Link has set up manufacturing / assembly facilities for Fiber Optic Products to manufacture Fiber optic patch cords / Pig Tails, Fiber termination kits etc.

Another aspect of this new facility will be the ongoing development of the software and R & D center in areas of application and core programming respectively. A substantial part of this new installed capacity would be reserved for exports of active networking components to other D-Link OBU's.



New Product Releases

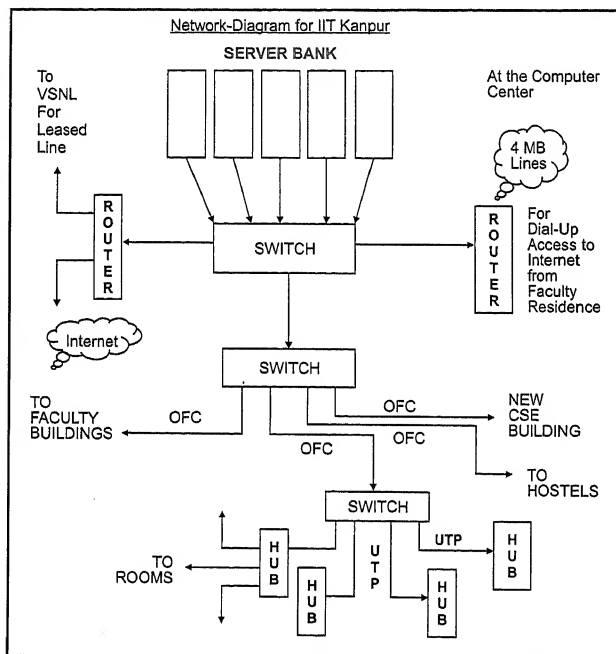
Model	Description
DFE-550TX	PCI-bus 10/100Mbps Fast Ethernet Network Interface Card with WOL
DFE-570TX	4 Port PCI Server Card
DIGI-5500TX	PCI-bus 10/100Mbps Fast Ethernet Network Interface Card with WOL
DFE-855 S	100 Base-T to 100 Base-FX Converter, Single Mode SC Fiber Connector for 30KM
DSL-200	ADSL USB MODEM with 1 USB Port and 1 ADSL Port
DSL-300	ADSL ETHERNET MODEM with 1 LAN Port and 1 ADSL Port
DWL-500	11 Mbps wireless PCI Card
DWL-650	11 Mbps wireless PCMCIA Card
DWL-1000AP	11Mbps wireless Access Point with 1 10Mbps LAN Port (IEEE 802.11b)
DES-3624I	20+2 Port N-Way Stackable Managed (master) Switch with 1-port SIO
DES-6000	DES-6000 base unit included chassis, back plate and CPU-board
DKVM-4	Pro Connect 4-Port KVM Switch
DKVM-8	Pro Connect 8-Port KVM Switch
DCM-100	Cable Modem (DOCSIS 1.0 certified)
DLM-128	High speed DSL based leased line Modem
DLM-2000	HDSL based DSL Modem
DFM-560ES	External 56Kbps Fax/Modem
DMB-815EM	Intel 815E Chipset based Micro ATX mainboard with AGP
SSC-350F	Digital Camera with Flash (Image Resolution 640 x 480)



Case Studies

D-Link provides solutions to IIT, Kanpur

Indian Institute of Technology (IIT), Kanpur is one of the premier institutes of India, providing quality technical education and knowledge to its students. One of the main centers of learning in India, the students from the hallowed portals of IIT - Kanpur are spread far and wide all over the world. It has a very impressive and state-of-the-art infrastructure to cater to the needs of students and faculties which includes lecture halls, seminar rooms, computer



center, hostels, faculty buildings, auditorium etc.

To improve its existing computer network and to provide connectivity to the students from the main building to their hostel rooms, IIT - Kanpur decided to call various networking vendors and system integrators. Against tough competition from the likes of Lucent and Amp, D-Link India Ltd. bagged the order for network installation. The primary reason for this was the fact that the computer department of IIT - Kanpur had already been buying D-Link products such as hubs, switches etc. since 1998 from Artek Enterprises, D-Link's distributor in Delhi.

The order placed by IIT - Kanpur was completed in two phases - the first phase of 1000 nodes was executed by March, 2000 and the subsequent phase of 2000 nodes was executed in May-June, 2001). D-Link met the entire passive

product requirements of IIT - Kanpur with structured cabling products such as E.Cat 5 cables, information outlets (I/O), patch cords, patch/ jack panels, pigtails, LIUs, SC couplers etc. These comprised of both fiber and copper products with the fiber component being approximately 10 % of the total value of the structured cabling products used.

The server bank at the Computer center is connected to Central Switches which, in turn, connect to LANs in the Computer Centre, various faculty buildings, offices, hostels etc.

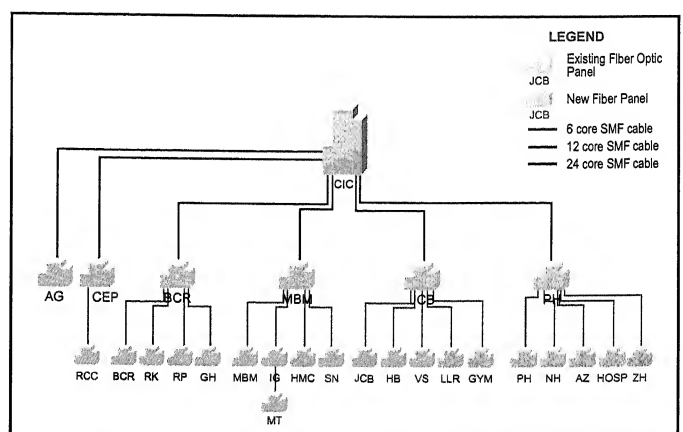
These LANs are linked through D-Link fiber optic cables laid all over the campus. D-Link structured cabling of E.Cat 5 UTP cables, jack panels, single and dual I/Os have been used for over 3000 nodes with combination of D-Link/ Cisco switches and D-Link hubs in the various LANs. A 4 Mbps leased line and some dial-up lines connect to the network to provide Internet facility to the LAN nodes, which constitute over 500 users through remote access servers (RAS) and modems.

Mr. Anil Gupta, Artek Enterprises is of the opinion that IIT-Kanpur is one of their best clients and one of their best network installations to date. In fact, Mr. Yogesh Sharma, General Manager - North also feels that with the easy availability due to the manufacturing plant at Goa and superior after sales service and technical support that D-Link provides, it is far ahead of the competition in the networking industry.

D-Link provides solutions to IIT, Kharagpur

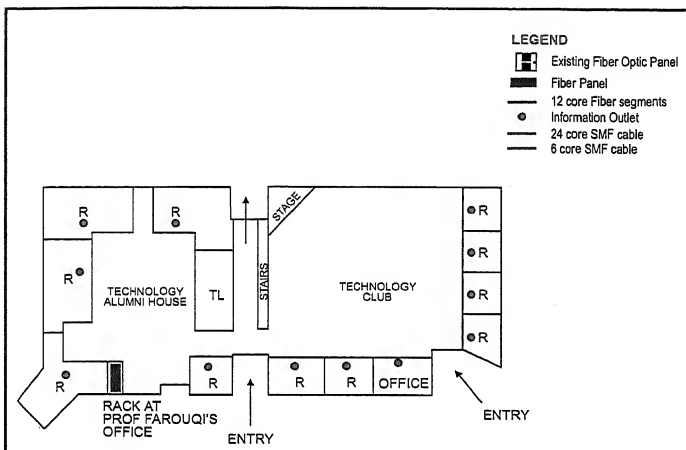
Continuing with the immense success of the IIT-Kanpur site, D-Link bagged another prestigious order - that of Indian Institute of Technology (IIT), Kharagpur. IIT-Kharagpur is also another very prestigious institute, which caters to most students of the Eastern areas who wish to major in Engineering and allied subjects.

The project entailed providing connectivity for the whole campus,



which included the main buildings, hostel, computer center etc. The basic requirement was for providing IP solutions which included IP telephony, e-learning solutions etc. The active backbone comprised of Cisco and D-Link, supplied by D-Link. The order for the passive components required by the network i.e. the Structured Cabling requirements was bagged by D-Link India Ltd. against tough competition from 3 - 4 other competitors, primarily Lucent. D-Link's structured cabling products used at the site included E.Cat 5 UTP cables, outdoor fiber cables, information outlets (I/O), patch cords, patch/ jack panels, pigtails, LIUs, SC couplers etc.

The whole project was undertaken by the IIT Foundation. This Foundation is financed by ex-students of IIT-Kharagpur, who are



now successful Silicon Valley entrepreneurs. Two such entrepreneurs who played a major role in selecting D-Link are Dr. Arvind Jain and Mr. Arjun Malhotra. While considering the networking vendors who had quoted for the order, they chose D-Link due to its ease of delivery, competitive price and superior quality. The order was bagged by our system integrator HCL Comnet Systems and Services Ltd.

According to Mr. Debraj Dam, Branch Manager - Calcutta, the IIT-Kharagpur order was like a "dream come true". He would like to thank Mr. M. N. Farouqui, Chairperson of IIT Foundation Project, for providing valuable inputs from time to time as well as acting as a bridge between the IIT Foundation members and D-Link; Mr. Kamal Nath, Regional Manager, Sales HCL Comnet Systems and Services Ltd., for positioning D-link as the brand of choice in IIT-Kharagpur; Mr. Vineet B., Proprietor, Sparnet Networks, for actual implementation on site and Mr. Suprabhat Chatterjee, Regional Manager, Sales, Cisco India Ltd. for his constant support etc.

Awards

K. R. Naik, CMD, D-Link India Ltd. awarded "International Networking Man of The Year, 2001"

Mumbai 5th June 2001 - The International Awards Committee, Maharashtra Information Technology Fair (MITF.com 2001), Government of Maharashtra conferred the award of "International Networking Man of the year - 2001" to Mr. K. R. Naik, Chairman and Managing Director, D-Link India Ltd, one of the major networking company in India at the International Awards presentation at Maharashtra Information Technology fair at the World Trade Centre, Mumbai.

This Award was given to Mr. K.R.Naik by Shri Ramrao Adik, Former Dy. Chief Minister of Maharashtra, Chairman International Awards Committee, MITF.com 2001 for his outstanding contribution to the Information Technology Industry in India.

D-Link has a wide range of networking, Internetwork Structured cabling Home products tremendous



● FAQ: Layer 3 switches

What is Layer 3 switching?

Layer 3 switching is the integration of two proven technologies: switching and routing. Layer 3 switches are running the same routing routines and protocols as traditional routers.

Q: What is the difference between Layer 3 switching and regular routing?

A: The main difference between traditional routing and Layer 3 switching is the addition of a group of Layer 2 switching domains and the execution of routing routines for most packets via an ASIC - in hardware instead of software.

A router has 1 or 2 LAN ports whereas a Layer 3 switch has many ports.

A router can work with heterogeneous technologies.

Q: Will Layer 3 switches always improve the performance of your network?

A: No. They will improve performance if your router is too slow to support the speed of the LANs your company uses.

Q: Do Layer 3 switch management systems differ from systems used to manage routers?

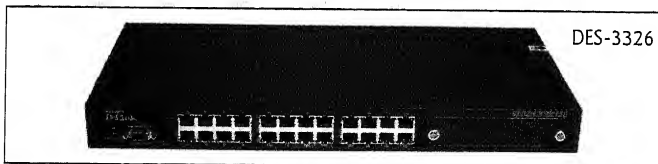
A: Yes. There are a lot of variations in management packages for Layer 3 switches just as there are lots of variations in router packages. IS managers need to look at each Layer 3 switch management package before deciding.

Q: How does a Layer 3 switch function?

A: The Layer 3 switch functions in the following manner:

- Determines forwarding path based on Layer 3 information.
- Validates the integrity of the Layer 3 header via checksum.
- Verifies packet expiration and updates accordingly.

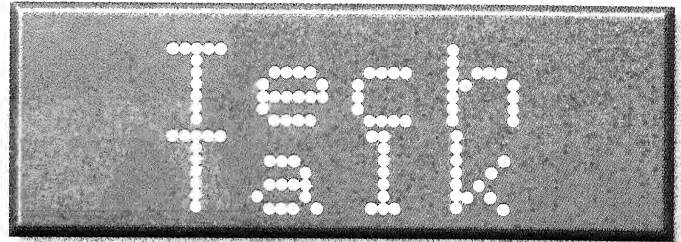
D-Link Layer 3 Switching Solution



Layer 3, 10/100Mbps Managed Ethernet Switch with Optional 2 Port Gigabit Ethernet Module

Product Features:

- Provide 24 10/100 MB Ethernet ports.
- One slot in front panel to install the following optional GE modules.
- 2-port 1000BASE-SX module, 2-port 1000BASE-LX module, 2-port 1000BASE-T and 2-port GBIC-based Gigabit Ethernet module.
- Full Wire Speed Layer 2 and Layer 3 switching (7 Mbps) via hardware.
- Support IEEE 802.1Q VLAN.
- Support Port Trunking (Link Aggregation) - Support IPv4.
- Support IGMP, IP Multicast packet filtering.
- Support RIP-1/11 routing protocol.
- QoS (Quality of Service) support.
- Support Multicast Routing protocol: DVMRP, PIM DM.



Optical fiber centralized network - Road to 'Fiber to The Desk'

The Network Cabling standards TIA/EIA-568B which is followed in America and most of the Asian countries and ISO/IEC 11801 which is recognized in EU and also world wide have recently issued their revised specifications. The revised standards now recognize the advantages of Fiber Optic technology over conventional transmission medium, Copper. The new standards take into consideration the need for companies to support higher bandwidths all the way to the workstation.

In the conventional, decentralized premise data network, backbone cables travels from a main cross-connect (or, in an inter-building network, an intermediate cross-connect) to one or more horizontal cross connects (HC) in telecommunications closets on each floor of a building. The HC typically includes active electronics equipment like hubs, concentrations or switches. Individual outlets for each user are located within 100m of the telecommunications closet (TC) and are connected to the HC using a single cable per user in a physical star configuration.

In the conventional designs, most of the inter- and intra-building backbone cable is optic fiber however the horizontal segment of the network typically is unshielded twisted pair (UTP) copper cable. The transmission distance limitation inherent in copper cabling makes distributed design a necessity, in that using copper in the horizontal network requires that data electronics be located no more than 100m from stations.

The traditional cabling infrastructure was designed to provide maximum flexibility in the deployment of distributed electronics. However, telecommunications closets take-up valuable real space and as they have active components they need power, controlled temperature and grounding. Decentralization increases complexity and presents multiple potential points of failure.

Moreover, the use of UTP copper cable in the conventional design places bandwidth limitations on the network. And because of its inherent electrical properties, UTP is vulnerable to electromagnetic interference (EMI), radio frequency interference (RFI), cross talk and breaches in data security. That is, copper is

fairly is easy to tap.

Today, after years of the decentralized network popularity, managers are turning to a more elegant, efficient and cost-effective design - the optical fiber centralized network. In increasing numbers, network planners are taking advantage of optical fiber's virtually unlimited bandwidth and low signal loss (attenuation) to implement a centralized design. All data electronics is housed in a single location and optical fiber cables provide direct connections to every workstation outlet in the network.

The fiber optic centralized network is simplicity itself. The main cross-connect is linked to desktop in one of the three ways-

1. Pull through, which involves passing cables through intermediate closets to the desktop with the use of patch panels.
2. Splice cabling, which involves fusion splicing pigtails or jumpers in intermediate closets and then linking to the desktop.
3. Passive patch panels use fiber patch cords and intra-building cables in intermediate closets.

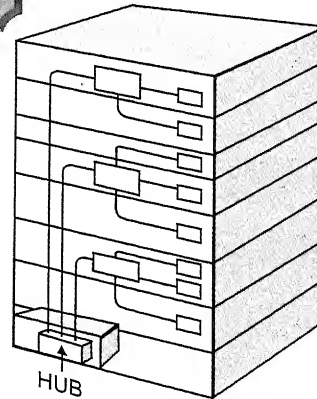
With direct connections between network hardware and desktops, maintenance and trouble shooting are vastly simplified. Speed upgrades are quick, easy and economical, many merely involve a change of port at the hub and network interface cards (NICs) at the desktop computer. The passive patch panels require little real estate. Also, unlike intermediate distribution frames which contain active electronics, passive patch panels require no power, air-conditioning or grounding.

The centralized optical fiber design has many benefits, including improved security, fewer points of failure, reduced telecommunication closet built-out costs. Consolidating network electronics, analyzers, uninterruptible power sources (UPSs), cross connects and servers in a single communication closet greatly simplifies local area network (LAN) management, provides more efficient use of hub ports and allows for simple implementation of various network applications. The deployment of redundant systems, including redundant UPSs, also reduces concern over single points of failure.

Moreover, the centralized optical fiber cabling design provides a cost effective alternative to the traditional design; maintenance and costs over the lifetime of the network will be reduced as well. Cable installation and testing are simplified, further reducing initial costs.

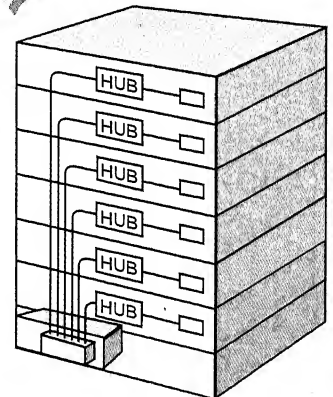
Centralized network designs simplify installations, reducing installation time and labor. Due to inclusion of new small form factor (SFF) connectors in the revised specification and availability of vertical cavity surface emitting laser (VCSEL) and reasonably lower rates, the dream of Fiber To The Desk (FTTD) is fast becoming a reality.

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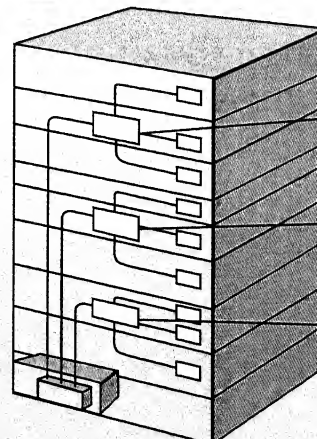


In the traditional cabling design, Cables run to active telecommunications closets located within 100m of users. Each closet contains active network electronics. Therefore, the space requires power, air-conditioning and grounding cables connected close to users.

In the centralized optical fiber cabling design, fiber to desktop is achieved with direct connections between a single hub and each user. All data electronics are housed in one location.



3



The centralized design is simple, yet it allows for flexibility in cabling configuration.

D-Link India Ltd. Loyalty Rewards Programme

Resellers and System Integrators who purchase D-Link branded networking products from D-Link authorized distributors or dealers will get a chance to win rewards totalling Rs. 60 lakhs under the 'Loyalty Rewards Programme'. The scheme is valid only till 30th September, 2001. The aim of this programme is to reward the loyal business partners by enhancing their margins.

The rewards as a part of this programme include incentives on sale which will be given directly from D-Link, participation in lucky draw, a free trip to Goa for select resellers and system integrators and attractive gifts and prizes which will be given after the programme ends. Coupons with certain points are issued against sales and these coupons can be redeemed for cash and also be included in a lucky draw if they are more than 500 points.

The list of points earned by each reseller and system integrator in the previous month should be forwarded to Mr. Vishal Chavan at D-Link, Mumbai by the 15th of every month.

For registration details and more information, contact your nearest D-Link authorized distributor.

● At Your Service

Sales: sales@dlink-india.com

Technical support: techsupport@dlink-india.com

Offices	Telephone	Fax
Bombay	(022) 690 2210	652 8476
Calcutta	09831030173	4632261
Delhi	(011) 6253915	6259233
Lucknow	(0522) 374478	374478
Pune	(020) 5450018	5450018
Hyderabad	(040) 7717392	7717392
Madras	(044) 8265213	8265213
Bangalore	(080) 6783137	6783561
Goa	(0832) 783393	783395
Ahmedabad	(079) 6580513	6580513
Indore	(0731) 268290	268290
Chandigarh	09814103875	
Jamshedpur	098351 82288	
Bhubaneswar	098610 66790	
Cochin	098470 45472	

The Last word

Dear Friends,

Once again a big "Thank You" for all your support during the financial year 2000-01. It was quite an eventful year for D-Link. Good growth, successful IPO and launch of Enterprise and Digital home products were some of the highlights.

With the inauguration of our third factory in May 2001 and launch of mother boards in July, we have further increased our manufacturing capacity to meet the increased customer demand and are all set to further consolidate our operations.

In order to serve you better, we have recently started our Jaipur, Bhubaneswar, Jamshedpur and Cochin offices bringing the total number of our offices in India to 16. In Bangalore, we now have our own building with increased staff strength and the Delhi office is now being shifted to a better and bigger premises.

The product range has been extended with the addition of Layer 3 switches and Gigabit backbone switches for the large enterprises. Last year, D-Link has marked a significant presence in the enterprise switch market and we are further set to consolidate our gains with excellent products like DES 3624L, DES 3225G and DES 3326.

We have also added a range of Cable and DSL modems, routers and Internet servers for ISP's and Internet users.

D-Link's Digital Camera has been a runaway success, notching up volumes month after month.

As we grow bigger with your support, we are determined to improve our customer support operations. The technical support teams at Mumbai, Bangalore and Goa have been expanded and tech personnel added at Hyderabad and Calcutta.

Come August and D-Link Logistics operations go "On-Line" to keep our customers up dated on the status of their orders. Complete order processing system has been put on web by spending around a crore of rupees on the newly developed software.

The response to our on going training programs-DCNI for network integrators, DCCI for SCS site certification vendors and Sales Pro for our channel partners is growing day by day. If you are interested, please contact your nearest D-Link office or the Distributor for registration.

Our only commitment is to enhance the satisfaction level of our customers through better products, better service and better support. That, I suppose is the key to our growth.

They say there is a slow down and there is recession, to which I can only say-

"It's not the Big that eat the Small but the Fast that eat the Slow."

Be competent, be competitive and be fast - you will be the winner.

Wishing you all the best,
With Regards,

P. Vyas

P.Vyas
Director - Sales

